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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,487	08/04/2006	Guido Schmitz	293369US0PCT	6702

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ALEXANDRIA, VA 22314

EXAMINER
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JACOBSON, MICHELE LYNN

ART UNIT	PAPER NUMBER
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1794

NOTIFICATION DATE	DELIVERY MODE
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10/23/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/588,487	<b>Applicant(s)</b> SCHMITZ ET AL.	
	<b>Examiner</b> MICHELE JACOBSON	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/23/09</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation "a) ... polyamide-forming monomers selected from the group consisting

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of lactams,  $\omega$ -aminocarboxylic acids and equimolar combinations of diamine and dicarboxylic acid” and “b) from 0 to 100 parts by weight of polyamide”, and the claim also recites “the sum of the components a) and b) comprising at least 20 parts by weight of monomer units derived from caprolactam and/or the combination hexamethylenediamine/adipic acid, hexamethylenediamine/suberic acid, hexamethylenediamine/sebacic acid, hexamethylenediamine/dodecanedioic acid, hexamethylenediamine/isophthalic acid or hexamethylenediamine/terephthalic acid” which is the narrower statement of the range/limitation. For the purpose of expediting examination, claim 1 will be interpreted to encompass the narrower recitation.

Appropriate clarification is required. Claims 2-20 are rejected for being dependent from indefinite claim 1. Appropriate correction is required.

4. Claim 1 is indefinite for the recitation of “auxiliaries”. The term “auxiliaries” is not specifically defined in the specification and is not sufficiently specific such that one of ordinary skill in the art would be reasonably apprised of the breadth and scope of the limitations it is intended to encompass. Appropriate clarification is required.

5. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1, from which claim 20 depends, recites a bonding agent layer II comprising three different types of components a, b and c. Claim 20 makes no reference to these components and instead recites that the “bonding agent layer II comprises PA6”. There is insufficient antecedent basis for this limitation in the claim since this recitation does not make reference to the three components recited in

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claim 1 to comprise the bonding agent layer II. An appropriate way to include the limitation that the bonding agent layer comprises PA6 would be to recite "wherein bonding agent layer II comprises 100 parts by weight component b) and wherein component b) comprises PA6". For the purpose of examination, claim 20 will be interpreted as such, but appropriate correction is required.

### ***Claim Objections***

6. Claim 7 is objected to because of the following informalities: Claim 7 recites the limitation "... which comprises a fluoropolymer **is** selected from the group ...". The examiner believes applicant intended to delete the word "is". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. U.S. Patent Application Publication No. 2002/0142118 (hereafter referred

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to as Schmitz) and Boer et al. U.S. Patent No. 6,355,358 (hereafter referred to as Boer) and Jadamus et al. U.S. Patent No. 6,428,866 (hereafter referred to as Jadamus).

9. Schmitz teaches a composite having two or more layers, which includes an EVOH barrier layer. (Para. 11) The ethylene content in the EVOH copolymer is recited to be between 25 to 60 mol%. (Para. 120) When composites having two or more layers are developed, for example, for use as a tube for carrying liquid or gaseous media in motor vehicles, the molding compositions must have sufficient chemical resistance to the media to be carried, and the tubes must meet all the mechanical requirements placed upon them, even after long exposure to fuels, oils or heat. In addition to meeting the requirement for adequate fuel resistance, the automotive industry demands improved barrier action from fuel piping, in order to reduce emissions of hydrocarbons within the environment. This has led to the development of tube systems having two or more layers, for example using EVOH as barrier layer material. However, EVOH is incompatible with PA11, PA12, PA612, PA1012 and PA1212, which can be used for the outer layer since they have good mechanical properties, good water absorption performance, and low susceptibility to environmental effects. It is therefore impossible to obtain the adhesion between the two layers that is indispensable for the application. However, EVOH is compatible with PA6, PA66, PA6/66, and with maleic-anhydride-functionalized polyolefins. Molding compositions based on polymers of this type are, however, unsuitable as outer layer material. (Para. 4-5)

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10. In order to solve the problem of adhesion of EVOH to PA11, PA12, PA612, PA1012 and PA1212 (Para. 12), Schmitz discloses an adhesive layer comprising (Para. 15-23):

- a. from 0 to 80 parts by weight of at least one polyamide selected from the group including PA6, PA66, PA6/66 and mixtures thereof;
- b. from 0 to 100 parts by weight of at least one polyamine-polyamide graft copolymer that includes the following monomer units;
  - i. from 0.5 to 25% by weight, based on the weight of the polyamine-polyamide copolymer, of at least one polyamine having at least 4 nitrogen atoms and having a number-average molar mass  $M_n$  of at least 146 g/mol, and
  - ii. at least one polyamide-forming monomer selected from the group including lactam,  $\omega$ -aminocarboxylic acid, equimolar combination of diamine and dicarboxylic acid, and mixtures thereof; and
- c. from 0 to 80 parts by weight of at least one polyamide selected from the group including PA11, PA12, PA612, PA1012, PA1212 and mixtures thereof;

11. Wherein, in the layer I, a total of the parts by weight of (a), (b) and (c) is 100; wherein within an entirety of (a) and (b), at least 20 parts by weight of the entirety include monomer units selected from the group including caprolactam, combination of hexamethylenediamine/adipic acid, and mixtures thereof; and

12. Wherein within an entirety of (b) and (c), at least 20 parts by weight of said entirety include monomer units selected from the group including  $\omega$ -aminoundecanoic

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acid, laurolactam, combination of hexamethylenediamine/1,12-dodecanedioic acid, combination of 1,10-decanediamine/1,12-dodecanedioic acid, combination of 1,12-dodecanediamine/1,12-dodecanedioic acid, and mixtures thereof. (Para. 15-23)

13. Such a multilayer article comprising the adhesive composition and an EVOH barrier layer is recited to be useful as a tubular article selected from the group including fuel pipe, brake-fluid pipe, coolant pipe, hydraulic-fluid pipe, fuel-pump pipe, air-conditioner pipe, and a vapor line or as a container, fuel container, filler pipe, and filler pipe for a tank. (Para. 45-46) The pipe may also be corrugated. (Para. 121) The composite may be produced by multicomponent injection molding, coextrusion or coextrusion blow molding. (Para. 127)

14. Additionally, at least one of the layers of the composite may be rendered electrically conductive in order to dissipate electrostatic charges generated by a moving medium for fuel contact applications. This is preferably the layer directly in contact with the moving medium. (Para. 67)

15. Examples of laminates produced according to the invention are recited to include an article comprising the following layers: PA11, PA12, PA612, PA1012 and or PA1212/ adhesive layer/ EVOH layer. (Configuration 2, Table 1)

16. Schmitz is silent regarding the disposal of a fluoropolymer or polyolefin layer in the interior of the tube recited.

17. Boer teaches the same adhesive composition disclosed by Schmitz for use in multilayer composites for storing flammable liquids, gases or fuel. (Col. 2, line 59-Col. 3, line 6, Col. 9, lines 6-10) Boer further teaches that a typical approach to bonding two



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different materials had been to produce an adhesion promoter consisting of a mixture of the two materials. (Col. 2, lines 7-9) In the invention of Boer, the adhesive is disclosed for use in bonding layers of polyamide and polyester to one another. It is recited that the polyamide component of the adhesion promoter should be readily compatible with the polyamide of the layer the adhesion promoter is bound to in order to facilitate good adhesion. (Col. 8, lines 26-28) Boer also teaches the addition of a 10-85 parts by weight of a polyester component to the adhesion promoter in order to further increase the adhesion between the adhesion promoter layer and the polyester layer. (Col. 8, lines 20, 38-47) Boer evidences it was known in the art at the time the invention was made that the addition of a polymeric component compatible with or corresponding to the type of polymer the adhesive composition was intended to be bound to increased adhesion between the adhesion layer and the polymeric layer.

18. Jadamus teaches a multilayer article comprising an outer layer comprising a thermoplastic molding composition and an inner electrically conductive thermoplastic layer that can be used for pipes, hollow bodies (such as fuel tanks), filling ports, brake lines, fuel lines, cooling lines and tanks. (Col. 1, lines 64-67, Col. 2, lines 14-16, Col. 5, lines 31-40) The outer layer of the article is recited to comprise molding compositions including polyamides, polyolefins or polyesters. (Col. 2, lines 20-24) Materials suitable for the inner layer are recited to include polyamides, polyolefins and fluoropolymers. (Col. 2 lines 24-28)

19. Suitable polyamides include PA6, PA66, PA612, PA810, PA1010, PA1012, PA11, PA12 and PA1212. (Col. 2, lines 29-33) Preferred polyolefins include

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polyethylene; polypropylene; ethylene copolymer with n-butyl acrylate, methyl methacrylate, maleic anhydride, styrene, vinyl alcohol, acrylic acid, or glycidyl methacrylate; isotactic or atactic homopolypropylene. (Col. 3, lines 32-45) Suitable fluoropolymers include ETFE, THV, ECTFE and PVDF. Barrier layers for fuel components comprising PVDF, ETFE, THV, polyolefins, and EVOH may also be present. (Col. 5, lines 1-5)

20. Schmitz, Boer and Jadamus are all directed to multilayer articles comprising polyamide suitable for fuel contact applications. One of ordinary skill would have been motivated to include a fluoropolymer or polyolefin interior layer such as those disclosed by Jadamus in the multilayer article recited by Schmitz in order to increase the fuel barrier properties of the laminate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have adhered an additional barrier layer to the EVOH layer in the invention disclosed by Schmitz. This would have produced a laminate comprising the following layers: PA11, PA12, PA612, PA1012 and or PA1212/ adhesive layer/ EVOH layer (ethylene content between 25 to 60 mol%)/ adhesive layer/ fluoropolymer or polyolefin layer.

21. As taught by Boer, one of ordinary skill would have been motivated to include 10-85 parts by weight of the fluoropolymer or polyolefin material in the adhesive composition between the EVOH and fluoropolymer or polyolefin layer in order to increase the adhesion between the two layers. This would have resulted in an adhesive layer as recited above by Schmitz that also included 10-85 parts by weight fluoropolymer or polyolefin. This composition would have been the same as that recited

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by applicant in claim 1. These obvious modifications to the invention of Schmitz would have produced the same invention as claimed in claims 1-6, 10-12, 14 and 17-20.

22. Regarding claims 7-9: Jadamus specifically discloses the fluoropolymers PVDF, ETFE and THV and the polyolefins polyethylene and isotactic polypropylene as useful barrier materials. Jadamus also discloses maleic anhydride grafted polyolefin which is universally known to be an adhesion modified polymer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized a barrier material modified with respect to adhesion in order to increase the adhesion between the fluoropolymer or polyolefin barrier layer and the multilayer article. This would have produced the invention as claimed in claim 9.

23. Regarding claim 13: Applicant's specification discloses that "Corrugated pipes are prior art" in paragraph 60 of the pre-grant publication. Additionally, Schmitz specifically recites that the pipe may also be corrugated.

24. Regarding claim 15: Schmitz specifically recites that pipe include an electrically conductive layer.

25. Regarding claim 16: Schmitz specifically recites multicomponent injection molding, coextrusion or coextrusion blow molding.

***Response to Arguments***

26. Applicant's arguments filed 6/30/09 have been fully considered but they are not persuasive.

27. Applicant has asserted on page 9 of the remarks that because there is not an explicit disclosure in the teachings of Schmitz, Boer or Jadamus of the use of the adhesive composition recited by Schmitz and Boer for adhering EVOH to a polyolefin or fluoropolymer layer that one of ordinary skill would not have arrived at the claimed invention. However, as stated above, an adhesive composition comprising the same components as claimed by applicant is recited by both Schmitz and Boer. Schmitz utilizes the composition to adhere EVOH to polyamide while Boer utilizes the composition blended with polyester in order to adhere EVOH to polyester. As stated above, Boer teaches the blending of adhesive compositions with an amount of the polymer they are intended to adhere to in order increase the adhesion between the adhesive composition and the polymer layer. The scope and breadth of the prior art clearly teach that the adhesive composition recited by Schmitz and Boer and applicant was well known to adhere to EVOH. The prior art also teaches the utility of fluoropolymer and polyolefin polymer layers as interior layers in tubing for applications requiring contact with fuel. As taught by Boer, it would have been obvious to one of ordinary skill in the art to employ a blend of polyolefin or fluoropolymer with the polyamide based adhesive disclosed by Schmitz and Boer and known to have good

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adhesion to EVOH in order to adhere a polyolefin or fluoropolymer layer, respectively, to an EVOH layer.

28. Applicant has asserted on page 9 that "it would be impossible to predict to what extent, if any, the layer I material of Schmitz or the adhesion promoter of Boer would have on adhering the presently-recited layers I and III". However, applicant has not presented reasoning or evidence to support this assertion. The examiner has established that the level of ordinary skill in the art as taught by Boer evidences that it is a typical approach when attempting to bond two different materials to utilize a blend of those materials. Therefore, one of ordinary skill in the art would have had a reasonable expectation that blending the polymers as asserted above would have successfully produced adhesion between the fluoropolymer or polyolefin and EVOH layers. As such, applicant's assertion that there is no predictability in the art is not found persuasive.

29. Applicant has asserted on pages 9 and 10 of the remarks that there are no incompatible range limitations in claim 1. However, applicant's argument that "however the 0 to 80 parts by weight component II.a) and the 0 to 100 parts by weight of the component II.b) are distributed, at least 20 parts thereof have the particular monomer units recited" does not resolve the fact that the particular monomer units recited present a narrower limitation than the monomer units recited for component a) and certainly for the generic recitation of "polyamide" in component b). Therefore, applicant's arguments have not been found persuasive. The examiner suggests that these limitations would be more definite if placed in a dependent claim.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MICHELE JACOBSON** whose telephone number is (571)272-8905. The examiner can normally be reached on Monday-Thursday 8:30 AM-7 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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